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**AN APPLICATION OF THE STONEY PATENT SLUICE
TO RIVER IMPROVEMENTS.**

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Among the more important contributions of late years toward the improvement of canal works is the Stoney Patent Sluice.

This invention renders it possible to raise, by a small expenditure of power, a counter-balanced vertical bulkhead of steel, of unusual dimensions and with a heavy head of water against its face. The bulkhead bears against rollers set in a moveable frame, and the friction which would otherwise result from the immense pressure is thereby reduced to a minimum.

Under certain conditions of river improvement it has occurred to the writer that these sluices might be employed in such a way that the usual form of lift-lock could be dispensed with. The conditions chosen as an example are as follows: A rapid, in an otherwise navigable river with a fall of ten feet in about a mile in length.

Referring to the sketch, it will be seen a bank is formed on one side of the river for the entire length of the rapid, to form a canal.

At intervals of about half a mile three pairs of gates are placed dividing the canal into two reaches. At each end of each reach are Stoney sluices connecting directly with the rapid. A vessel ascending passes through the first pair of gates, which are then closed, and as she proceeds through the first reach, the sluices at the upper end of it are opened and the water enters from the rapid, raising the reach to the level of the water half way up the rapid.

The second pair of gates can then be opened, and the vessel passes into the second reach, which is raised in a similar manner by opening the sluices at the upper end, connecting with the river at the head of the rapid.

The third pair of gates can then be opened, and the vessel continues on her way.

The advantages attending this scheme of river improvements may be set forth as follows:

Vessels may pass through the canal without stopping, at the usual rate fixed for canals; this, particularly in case of long tows of barges, would shorten the time of passage very much.

Vessels would never be near a canal gate when there was a head of water against it; the dangers attending the usual kind of lockage, the bringing of large vessels to rest within a few feet of closed gates, as well as the damage done to shipping, would be done away with.

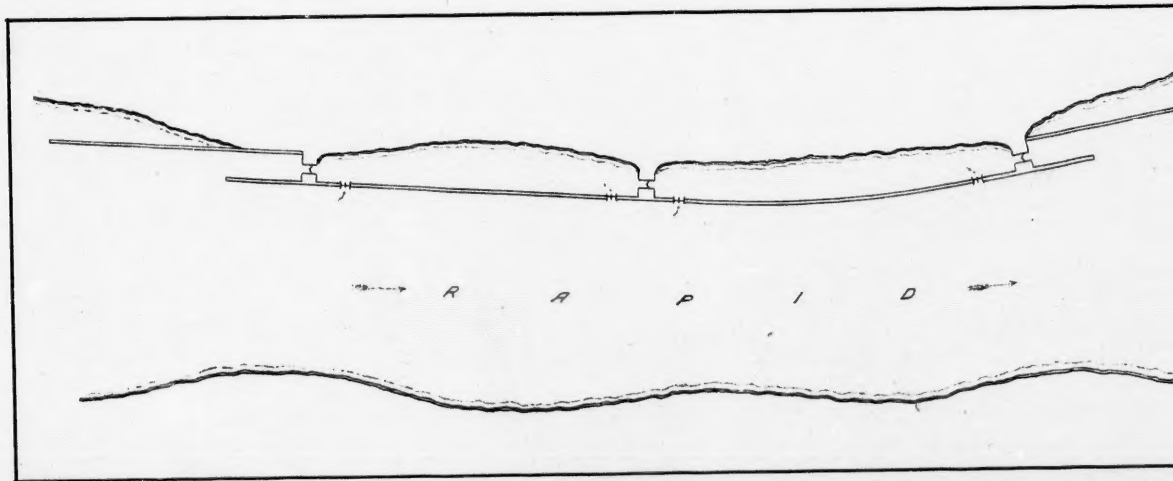
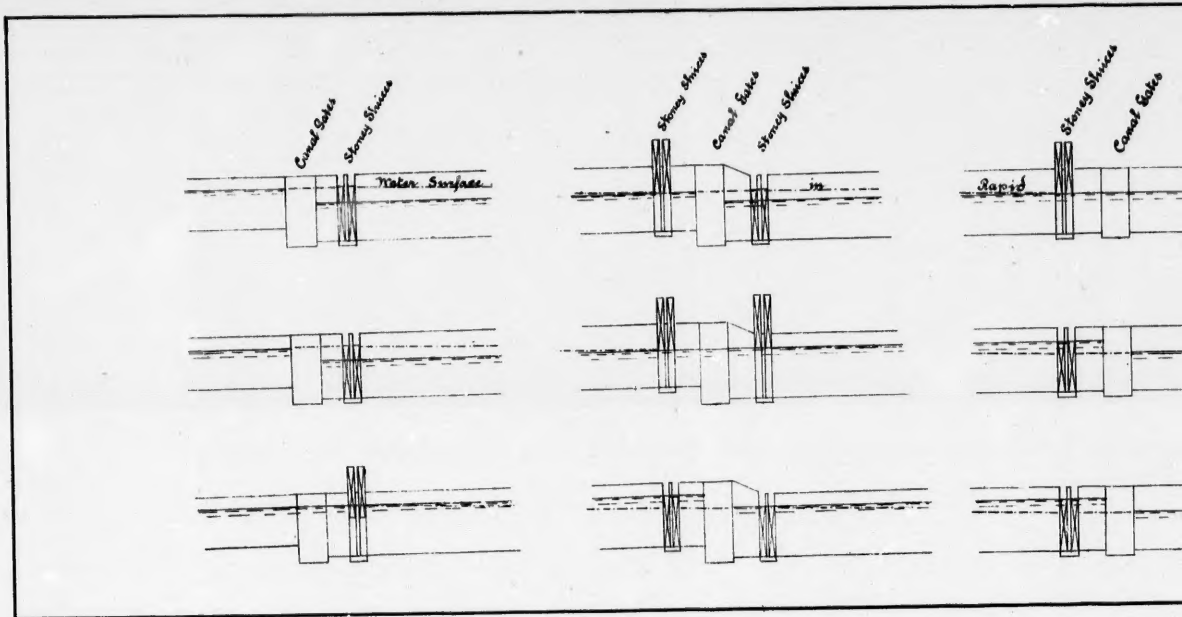
The head of water against banks and structures would never be more than a few feet, thereby lessening the cost of construction.

The length of vessels is not limited.

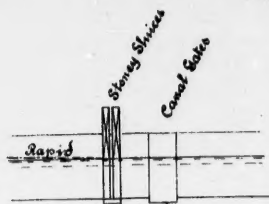
Under favourable conditions there would be a saving in cost of construction, principally in masonry.

The reason for placing the sluices between the canal and the river is that each reach may thus have an independent supply of water; but when this system is applied in its simplest form, that is, with only one reach and a pair of gates at each end, it is then possible the sluices would be placed on the landward side of the gates, which would have the advantage of more accessible foundations, but the disadvantage of causing currents in the entrances.

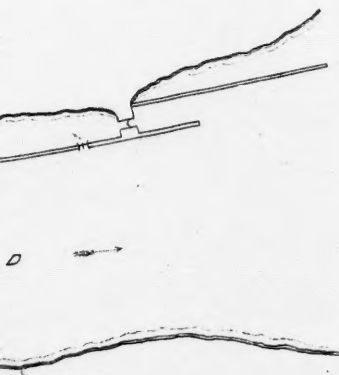
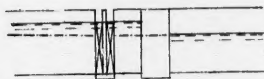
In cases where the whole discharge of a river is controlled, the adjoining reaches, providing they are not of too great an area, might be brought to the same level at suitable intervals of time by means of these sluices, permitting the passage of vessels up or down without the intervention of lift-locks.



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VOL. IX. PLATE I.



— River Improvement —
— with —
— Stoney Patent Sluices —
Longitudinal Sections



— Plan of River Improvement —
— with —
— Stoney Patent Sluices —